Claims

1. Degradation-resistant polyamide producible by anionic polymerisation of at least one lactam in the presence of at least one basic catalyst and if necessary at least one activator, with addition of a desactivator after completed polymerisation in the melt state,
characterised in that
the desactivator comprises a proton donor and an amine.

2. Polyamide according to claim 1,
characterised in that the amine is a non-volatile secondary or tertiary amine.

3. Polyamide according to claim 2,
characterised in that the amine is an N-dimethylated fatty amine with 12 - 18 C atoms.

4. Polyamide according to claim 3,
characterised in that the amine function is sterically hindered.

5. Polyamide according to claim 4,
characterised in that the amine is a HALS amine.

6. Polyamide according to at least one of the claims 1 to 5,
characterised in that the proton donor is an or-

ganic carboxylic acid or polycarboxylic acid.

7. Polyamide according to claim 6, characterised in that the organic carboxylic acid is present in the form of an oligomeric wax-like product, preferably as polyethylene wax, which contains carboxyl groups, or as a cooligomer or copolymer.

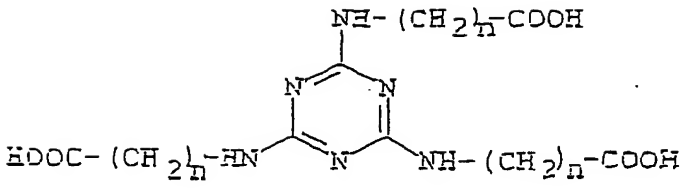
8. Polyamide according to claim 6, characterised in that the proton donor is an ethylene(meth)acrylic acid oligomer or polymer.

9. Polyamide according to claim 8, characterised in that the polymer is an ethylene(meth)acrylic acid copolymer.

10. Polyamide according to claim 6, characterised in that the carboxylic acid is a copolymer with monomers containing acid groups, which occur partially as a salt (ionomers) and the cation is preferably Zn^{++}.

11. Polyamide according to at least one of the claims 1 to 10, characterised in that the desactivator comprises a compound, which has at least one proton-donating group and at least one amino group.

12. Polyamide according to claim 11, characterised in that the desactivator is selected from compounds of the general formula I



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with n = 1 to 10, preferably 5.

13. Polyamide according to at least one of the claims 11 and 12,
characterised in that a non-volatile secondary or tertiary amine is added in addition to the desactivator.

14. Polyamide according to at least one of the claims 1 to 13,
characterised in that the polyamide has a relative viscosity η_{rel} of 1.5 - 4.0, measured in a 0.5% by weight solution in m-Cresol according to EN.ISO 307.

15. Polyamide according to at least one of the claims 1 to 14,
characterised in that the lactam has 6 - 12 C atoms, preferably is lactam 6 and/or lactam 12 or a mixture thereof.

16. Polyamide according to at least one of the claims 1 to 15,
characterised in that the catalyst is an alkali lactamate or a lactamate-forming compound.

17. Polyamide according to at least one of the claims 1 to 16,
characterised in that the activator is selected from the group of acylated lactams, isocyanates and carbodiimides which can be present also in capped or cyclised form.

18. Polyamide according to at least one of the claims 1 to 17,
characterised in that a liquid system, which contains the activator and the catalyst in a liquid polar aprotic solvation medium, is used for the polymerisation control.

19. Polyamide according to at least one of the claims 1 to 18,
characterised in that the polyamide is present as a granulate.

20. Polyamide according to at least one of the claims 1 to 18,
characterised in that the polyamide occurs as moulded articles in the form of injection moulding parts, fibres, films, plates, pipes, coatings, shaped or profile pieces.

21. Method for continuous production of a degradation-resistant polyamide starting from the resulting polylactam comprising at least one lactam with addition of at least one basic catalyst and if necessary of at least one activator by means

of a polymerisation at a temperature between 140 and 320°C,
characterised in that
a proton donor and an amine is added to the resulting polylactam in the melted aggregate state as desactivator.

22. Method according to claim 21,
characterised in that the desactivator is added in the form of a melted master batch.

23. Method according to claim 21 or 22,
characterised in that the method is implemented in a continuous mixer, e.g. in an extruder.

24. Method according to claim 23,
characterised in that the method is implemented in a twin-screw extruder.

25. Method for processing polyamide or the polymer blend thereof, which was produced by anionic polymerisation of lactam in the presence of at least one basic catalyst and if necessary at least one activator, in which method the polyamide or the polymer blend thereof is melted and, before further processing, a proton donor and an amine is added to the melt in the molten state as desactivator.

26. Method according to claim 25,
characterised in that the desactivator in the form of a master batch granulate is added before

remelting to a PA granulate produced via anionic polymerisation.

27. Method according to claim 25 and 26, characterised in that, after granulation of the polyamide, the desactivator is applied to the polyamide granulate by means of adhesion-promotor before processing into the moulded article.

28. Method according to at least one of the claims 25 to 27, characterised in that the polyamide or the polymer blend thereof is comminuted before thermoplastic conversion into the finished part as an intermediate method step and is present thereby as a granulate.

29. Method according to at least one of the claims 21 to 28, characterised in that a non-volatile secondary or tertiary amine compound is used as amine.

30. Method according to claim 29, characterised in that the secondary amine compound carries at least one sterically hindered $C_1 - C_{18}$ alkyl group.

31. Method according to at least one of the claims 21 to 30, characterised in that an organic carboxylic acid is used as proton-donating compound.

32. Method according to claim 31,
characterised in that the proton donor is an acidic polyethylene wax in which the carboxylic acid is preferably part of the chain.

33. Polyamide according to claim 31 or 32,
characterised in that the proton donor is an ethylene(meth)acrylic acid copolymer.

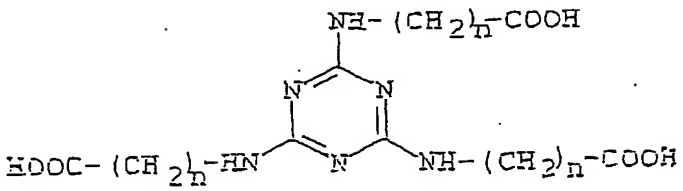
34. Polyamide according to at least one of the claims 31 to 33,
characterised in that the proton donor is a copolymer with monomers containing carboxylic acid groups, which monomers are present partially as a salt (ionomers), the cation preferably being Zn^{++}.

35. Method according to at least one of the claims 21 to 34,
characterised in that the concentration of acidic groups (e.g. -COOH) is at least as great as the basicity originating from the catalyst but smaller than the sum of the basicity and the concentration of amine functions.

36. Method according to at least one of the claims 21 to 35,
characterised in that a compound is used as desactivator which has at least one proton-donating group and at least one amine group.

37. Method according to claim 36,

characterised in that the compound is selected from the general formula I



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with n = 1 to 10, preferably n = 5.

38. Method according to at least one of the claims 21 to 37,
characterised in that the lactam has 6 - 12 C atoms, preferably lactam 6 and/or lactam 12.

39. Method according to at least one of the claims 21 to 38,
characterised in that the catalyst is an alkali lactamate or a compound forming a lactamate.

40. Method according to at least one of the claims 21 to 39,
characterised in that the activator is selected from the group of acylated lactams, isocyanates and carbodiimides, which can also be present in capped or cyclised form.

41. Method according to at least one of the claims 21 to 40,
characterised in that a catalytically acting liquid system is used for the polymerisation control, in which system the activator and the cata-

lyst are contained in a liquid polar aprotic solvation medium.

42. Method according to at least one of the claims 21 to 41,
characterised in that the desactivator, if necessary with further additives, is added in the form of a master batch, the master batch carrier being a thermoplastic.

43. Method according to claim 42,
characterised in that the master batch is produced by incorporation of the desactivator components in the melt of a thermoplastic and the thermoplastic is preferably polyamide and the master batch can contain further additives, in particular stabilisers.

44. Use of the method according to at least one of the claims 21 to 43 for producing granulate for the further thermoplastic processing into polyamide moulded articles, or for direct production of moulded articles.

45. Use of the method according to at least one of the claims 25 to 43 for recycling polyamide or the polymer blends thereof.